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ASSIGNMENT BOOKLET 1A

MAT1037 Pure Mathematics 10
Module 1: Section 1 Assignment

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Date Assignment Submitted: _____	(If label is missing or incorrect) Student File Number: _____
Time Spent on Assignment: _____	Module Number: _____

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Assignment Grading: _____

Graded by: _____

Date Assignment Received:

Student's Questions and Comments

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Teacher's Comments

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Teacher

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Pure MATHEMATICS 10

Module 1

Statistics and Data Tables

Assignment Booklet 1A

Learning Technologies Branch

Alberta LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Section 1 Assignment	30	

Teacher's Comments

Pure Mathematics 10
Module 1: Statistics and Data Tables
Assignment Booklet 1A
Section 1 Assignment
Learning Technologies Branch
ISBN 0-7741-2136-X

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Students	✓
Teachers	✓
Administrators	
Home Instructors	
General Public	
Other	

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- Alberta Learning, **http://www.learning.gov.ab.ca**
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ASSIGNMENT BOOKLET 1A
PURE MATHEMATICS 10: MODULE 1
SECTION 1 ASSIGNMENT

Your mark for this module will be determined in part by how well you do your assignments.

This Assignment Booklet is worth 30 marks out of the total 100 marks for Module 1. The value of each assignment and each question is stated in the left margin.

Work slowly and carefully. If you have difficulty, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

30

Section 1 Assignment: Sampling

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

1. A survey of city drivers was conducted at a downtown parkade. Drivers of vehicles stopped at the entrance barrier were asked whether they would consider using the transit system if fares were reduced.

(1) **a.** Name the sampling technique used in this survey.

(2) **b.** Identify the population and the sample.

(2) **c.** Is this sampling technique a probability or non-probability technique? Explain.

(4) **d.** Design a simple random sampling technique that would be appropriate in this study.

(5)

2. There are 300 female students and 200 male students in a large high school. You have been asked by the students' council to survey the views of students on the length of breaks between classes. You decide to interview 50 students. Design a stratified sampling procedure that would be appropriate for this study.

3. Janice decides to select 5 students from her class to attend a local conference on the environment. There are 30 students in her class.

(2) **a.** How could Janice use simple random sampling to make her selection?

(2) **b.** How could Janice use systematic sampling to make her selection?

(4)

4. A survey question directed towards parents is written on a mail-in form included with their child's report card. The question is worded as follows:

> "There has been concern about the performance of Canadian students on international comparisons of mathematical achievement. Should the mathematics courses Canadian students take be made more demanding?"

Identify and explain two types of bias that is most likely to influence the result of this survey.

(4) **5.** Briefly describe two non-probability sampling techniques.

6. An area with a population of 10 000 people is deciding whether to allow the construction of a large hog-production facility. They plan to survey 500 residents in the town and surrounding area using a mail-in survey.

(1) **a.** What type of bias will most likely influence the results of a mail-in survey?

(1) **b.** What type of bias will influence the results if only people near the proposed plant site are selected?

(2) **c.** Describe how you would choose who will be surveyed.

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ASSIGNMENT BOOKLET 1B

MAT1037 Pure Mathematics 10
Module 1: Section 2 Assignment and Final Module Assignment

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Time Spent on Assignment: _____	Module Number: _____

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Pure MATHEMATICS 10

Module 1

Statistics and Data Tables

Assignment Booklet 1B

Learning
Technologies
Branch

Alberta
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FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Section 2 Assignment	30	
Final Module Assignment	40	
	70	

Teacher's Comments

Pure Mathematics 10
Module 1: Statistics and Data Tables
Assignment Booklet 1B
Section 2 Assignment and Final Module Assignment
Learning Technologies Branch
ISBN 0-7741-2137-8

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ASSIGNMENT BOOKLET 1B
PURE MATHEMATICS 10: MODULE 1
SECTION 2 ASSIGNMENT AND FINAL MODULE ASSIGNMENT

Your mark for this module will be determined in part by how well you do your assignments.

This Assignment Booklet is worth 70 marks out of the total 100 marks for Module 1. The value of each assignment and each question is stated in the left margin.

Work slowly and carefully. If you have difficulty, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

(30)

Section 2 Assignment: Numerical Data

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

(3)

1. On the right is a clipping of the High School Soccer League standings that appeared in the school's newspaper. What would happen to the standings if a win was worth 3 points and a tie was worth 1 point? **Note:** If two teams have the same number of points, the team with the more wins is listed first.

High School Soccer League Standings

School	W	L	T	Pts
Appleby H.S.	2	0	3	7
Centre H.S.	3	2	0	6
Brook H.S.	2	1	2	6
Downs H.S.	1	1	3	5
Eastwood H.S.	2	3	0	4
Forest H.S.	0	3	2	2

2. Igor regularly eats at a local restaurant. The following table gives the cost of two meals.

Price	GST	Tip	Total
$10.00	$0.70	$1.25	$11.95
$12.00	$0.84	$1.50	$14.34

(1) **a.** What is the rate of GST?

(1) **b.** How does Igor calculate his tip?

(2) **c.** Modify the table if Igor tips at 15% after the GST is added.

3. Sarah borrowed $3500 to purchase a car. She negotiated the loan at an annual rate of 7%, with the interest calculated monthly on the opening balance.

	A	B	C	D
1	**Consumer Loan with Monthly Payments**			
2				
3	**Number of Years**	1		
4	**Annual Rate**	7.00%		
5	**Principal**	$3500.00		
6	**Monthly Payment**	$302.84		
7				
8	**Month**	**Opening Balance**	**Interest**	**Closing Balance**
9	1	$3500.00	$20.42	$3217.57
10	2	$3217.57	$18.77	$2933.50
11	3	$2933.50	$17.11	$2647.77
12	4	$2647.77	$15.45	$2360.37
13	5	$2360.37	$13.77	$2071.29
14	6	$2071.29	$12.08	$1780.53
15	7	$1780.53	$10.39	$1488.08
16	8	$1488.08	$8.68	$1193.91
17	9	$1193.91	$6.96	$898.03
18	10	$898.03	$5.24	$600.43
19	11	$600.43	$3.50	$301.09
20	12	$301.09	$1.76	$0.00

(2) **a.** What is the period of the loan? What is the interest period?

(3) **b.** What is the total interest paid? What is total interest as a percentage of the original loan? Is this greater or less than 7%? Explain the difference.

(1) **c.** How much of the monthly payment went towards the opening balance for the seventh month?

(2) **d.** Give the spreadsheet formula for cell D15.

(2) **e.** Are the rows of this table related recursively? Explain.

(3) **4.** Rahime deposited $2000 into an account bearing interest at 6% per annum compounded semi-annually. Assuming interest rates do not change, if Rahime leaves his money in this account for 35 years, how much interest will he earn? Show your work if you solve this question algebraically, or include a printout of your spreadsheet if you are using a computer.

5. The following spreadsheet shows data for the repayment of a small loan.

	A	B	C	D	E	F
1	Year	Opening Balance	Interest Rate	Interest Charged	Monthly Payment	Closing Balance
2	1	$3000.00	9%	$270.00	$545.07	$2724.93
3	2	$2724.93	9%	$245.24	$545.07	$2179.95
4	3	$2179.95	9%	$196.20	$545.07	$1634.97
5	4	$1634.97	9%	$147.15	$545.07	$1089.99
6	5	$1089.99	9%	$98.10	$545.07	$545.01
7	6	$545.01	9%	$49.05	$545.10	$0.00

(2) **a.** What is the total interest paid on the loan?

(2) **b.** What formula would be used in cell F5?

(2) **c.** Why is the last payment slightly different from the first five payments?

(4) **6.** Explain what a computer database is and how it might be used.

(40)

Final Module Assignment

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

(2)

1. What is the population implied by the following statement?

> Most people who are in elected positions in civic politics in your community are there because they want to serve the public.

(4)

2. Design a probability sampling technique that could be used to test the statement in question 1.

(2) **3.** Explain why a sample is usually used instead of surveying the entire population.

_____

_____

_____

_____

4. Identify the population that would be used in each of the following situations.

(1) **a.** an increase in ticket prices for the Edmonton Oilers hockey games

_____

(1) **b.** the quality of food in a school cafeteria

_____

(2) **5.** Why is a systematic sample often used when checking items produced in an assembly line?

_____

_____

_____

(3) **6.** You question 10 of your friends about a movie that you have seen and liked. Because 8 out of 10 of your friends also liked the movie, you conclude that 8 out of 10 people in your town or city would also like this movie.

Explain what is wrong with your conclusion.

_____

_____

_____

_____

(3) **7.** Your school does a survey by asking a question over the intercom and then having the students drop their responses in the school's suggestion box.

Which sampling method has been used? Comment on the validity and reliability of this survey method.

8. Use following spreadsheet to answer questions 1.a. to 1.e.

	A	B	C	D	E
1	Year	Cost of Item Jan. 1	Interest Rate	Price Increase	Cost of Item Dec. 31
2	1991	$1200.00	5.61%	$67.32	$1267.32
3	1992	$1267.32	4.36%		
4	1993		3.88%		

(2) **a.** Write, in words, how the value in cell D2 was calculated; then give the formula.

(2) **b.** Determine the price increase in 1992.

(1) **c.** What do you need to know to determine the cost of an item on January 1, 1993?

(2) **d.** Explain and state the name for this type of table.

(2) **e.** Complete the table given at the beginning of question 8. **Note:** If you are not using a spreadsheet program, do the calculations with your calculator running. Do not round values at each calculation.

9. A person in a small business has made a $60 000 loan to expand the building facilities. The following table shows how the bank has scheduled the repayment of the loan. Answer the questions that follow and complete the table.

	A	B	C	D	E
1					
2					
3	**Principal**	$60 000.00			
4	**Annual Interest Rate**	7.25%			
5	**Annual Payment**	$8641.64			
6	**Number of Years**	10			
7					
8	**Payment Number**	**Opening Balance**	**Interest Charged**	**Closing Balance**	**Total Interest**
9	1	$60 000.00	$4350.00	$55 708.36	$4350.00
10	2	$55 708.36	$4038.86	$51 105.58	$8388.86
11	3	$51 105.58	$3705.15	$46 169.10	$12 094.01
12	4	$46 169.10	$3347.26	$40 874.72	$15 441.27
13	5	$40 874.72	$2963.42	$35 196.50	$18 404.69
14	6	$35 196.50	$2551.75	$29 106.61	$20 956.43
15	7	$29 106.61	$2110.23	$22 575.20	$23 066.66
16	8	$22 575.20	$1636.70	$15 570.26	$24 703.37
17	9				
18	10				

(1) **a.** What is the term of the loan?

(2) **b.** Write the formula used to calculate cell C9.

(2)

c. The formula for the closing balance in cell D9 is "=B9+C9–B5". Explain what the formula is doing and why $ symbols are used in the last part.

_____

_____

_____

_____

10. Mark deposited $1000 into an account bearing interest at 6% compounded annually. He set up the following spreadsheet to project what his account balance would be if interest rates remain the same.

	A	B	C	D
1	Year	Opening Balance	Interest	Closing Balance
2	1	$1000.00	$60.00	$1060.00
3	2	$1060.00	$63.60	$1123.60
4	3	$1123.60	$67.42	$1191.02
5	4	$1191.02	$71.46	$1262.48
6	5	$1262.48	$75.75	$1338.23
7	6	$1338.23	$80.29	$1418.52
8	7	$1418.52	$85.11	$1503.63
9	8	$1503.63	$90.22	$1593.85
10	9	$1593.85	$95.63	$1689.48
11	10	$1689.48	$101.37	$1790.85

(2)

a. Write the formulas for each of the following cells.

Cell	Formula
C2	
D2	
A3	
B3	

(4)

b. Prepare a similar spreadsheet, and print the table showing the amounts for the first 20 years.

Attach your spreadsheet here.

(2)

c. What is the total interest Mark would earn if he left the money in his account for 20 years?

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